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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/849,349	05/18/2004	Motomi Matsunaga	1232-5416	6734

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MORGAN & FINNEGAN, L.L.P.  
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NEW YORK, NY 10281-2101

EXAMINER
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CHAPEL, DEREK S

ART UNIT	PAPER NUMBER
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2872

MAIL DATE	DELIVERY MODE
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05/07/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

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<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/849,349		MATSUNAGA, MOTOMI	
	<b>Examiner</b>		<b>Art Unit</b>	
	Derek S. Chapel		2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 April 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 and 7-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Status Of Claims***

1. This Office Action is in response to an amendment received 4/5/2007 in which Applicant lists claim 6 as being cancelled, claims 1-2, 7 and 9-14 as being previously presented and claims 3-5 and 8 as being original. It is interpreted by the examiner that claims 1-5 and 7-14 are pending.

### ***Continued Examination Under 37 CFR 1.114***

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/5/2007 has been entered.

### ***Priority***

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Claim Objections***

4. Claims 8 and 14 are objected to because of the following informalities: preamble statements of dependent claims should be consistent with the claim from which they depend. Claims 8 and 14 appear to be "quasi-independent" claims and should be rewritten in independent form including all of the limitations of the claim from which it depends.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim 7 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. It is unclear how an optical system as claimed in claim 1, which is embodied by figure 1 of the applicant's figures, can also include "a case where an inner product which is formed between outer products each formed by a vector indicating incident light and a vector indicating reflected light in the respective reflections at the reflective surface is negative" (as embodied in figures 2 and 3 of applicant's figures).

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1, 3-5 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Takeyama, U.S. Patent Publication 2002/0039232, of record (hereafter Takeyama).

9. As to claim 1, Takeyama discloses an optical system which guides a displaying luminous flux from a display device to an eye of an observer (see figure 14), comprising:

a first optical element (see figure 14, element P1) and a second optical element (see figure 14, element P2) in order from the side of an exit pupil of the optical system (see figure 14, element 31) to the side of the display device (see figure 14, element 36, and col. 23, lines 1-12),

wherein a combined optical power provided by an emergent surface of the second optical element (see figure 14, element 41) and an incident surface of the first optical element (see figure 14, element 35) is a negative optical power (it is noted by the examiner that the emergent surface of the second optical element and the incident surface of the first optical element appear to have a negative power because of the similarity between the shape of the space of Takeyama to the shape of the space

shown in figure 1 of the applicant's drawings), and the optical system forms an intermediate image with the displaying luminous flux in the first optical element (see figure 14, the dotted line within element P1); and

wherein the first optical element includes at least a first surface which has a reflecting action (see figure 14, element 33/34) and a second surface which reflects the displaying luminous flux reflected by the first surface back toward the first surface (see figure 14, element 32) such that a central principal ray of the displaying luminous flux incident again on the first surface (see figure 14, element 33/34) is reflected and travels toward a substantially opposite side to a reflecting side in the previous reflection (see figure 14, element 32) with respect to a normal to the first surface at a hit point of the central principal ray (it is noted by the examiner that this limitation appears to be met by the optical system disclosed in figure 14 of Takeyama, wherein the optical structure and system of the applicant's recited system and the optical elements and system of figure 14 of Takeyama are similar to each other).

10. As to claim 3, Takeyama discloses that the optical system forms a pupil image in an optical path of the displaying luminous flux in the first optical element (see figure 14, element P1).

11. As to claim 4, Takeyama discloses that the optical system forms a pupil image in an optical path of the displaying luminous flux in the second optical element (see figure 14, element P2).

12. As to claim 5, Takeyama discloses that at least one of the first and second optical elements includes a reflective surface decentered with respect to an optical path of the displaying luminous flux (see figure 14, elements 33, 32, 34 and 42).

13. As to claim 8, Takeyama discloses a display device (see figure 14, element 36, and col. 23, Lines 1-12) which forms an original image (see figure 14, element 36); and the optical system according to claim 1 (see section 8 of this office action).

14. Claims 9 and 11-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Takagi et al, U.S. Patent Number 7,012,756 B2, of record (hereafter Takagi).

15. As to claim 9, Takagi discloses an optical system which guides a displaying luminous flux from a display device to an eye of an observer (see figure 17), comprising:  
a first optical element (see figure 17, element 31) and a second optical element (see figure 17, element 21) in order from the side of an exit pupil (see figure 17, element S1) of the optical system to the side of the display device (see figure 17, element SI, and col. 24, lines 17-24),

wherein a combined optical power provided by an emergent surface of the second optical element (see figure 17, element S8) and an incident surface of the first optical element (see figure 17, element S3/S7) is a negative optical power (see Diagram 1 provided by the examiner below; it is noted by the examiner that since rays emitted from display device 'SI' are diverging when passing through emergent surface 'S8' and continue to diverge when passing through incident surface 'S3, S7' and therefore the air lens formed by the emergent surface of the second optical element and the incident

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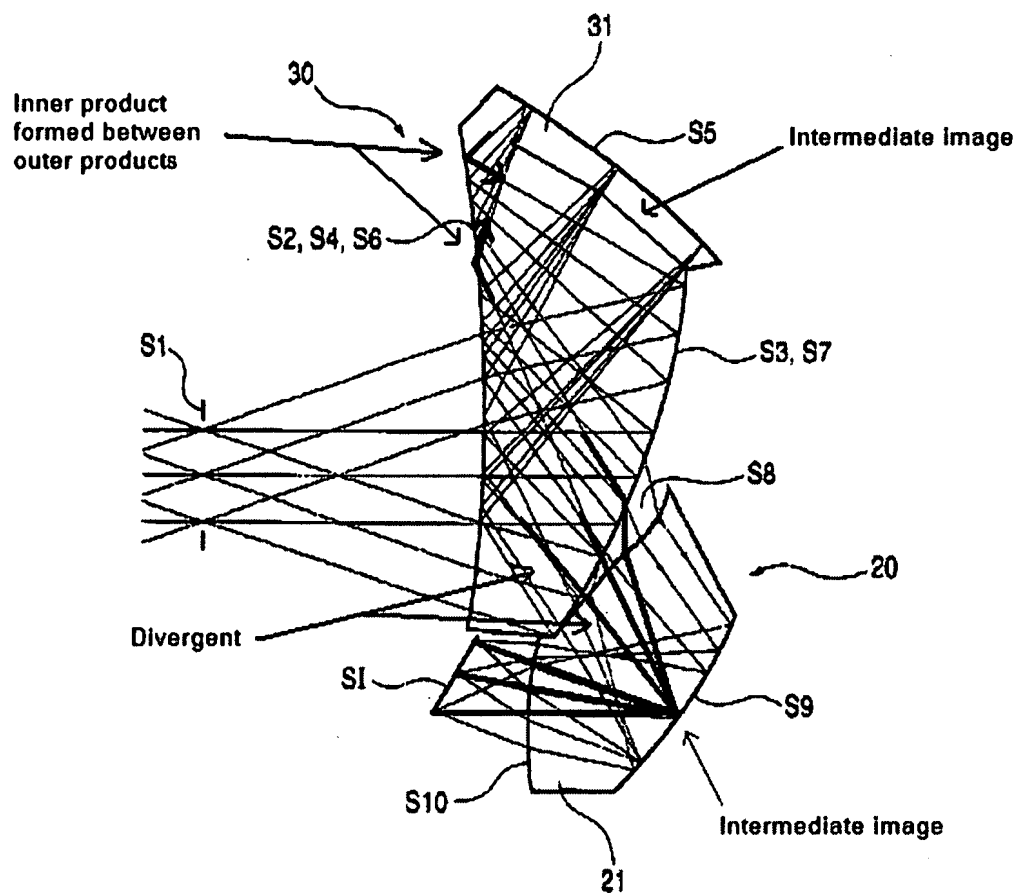
surface of the first optical element has a negative power), and the optical system forms an intermediate image with the displaying luminous flux in the first optical element (see figure 17, the top of element 31 and Diagram 1 provided by the examiner below);

wherein the first optical element (see figure 17, element 31) reflects the displaying luminous flux a plurality of times by a reflective surface which is decentered with respect to an optical path of the displaying luminous flux (see figure 17, elements S2-S7); and

wherein the optical system includes a case where an inner product which is formed between outer products each formed by a vector indicating incident light and a vector indicating reflected light in the respective reflections at the reflective surface is negative (see Diagram 1 provided by the examiner below).

**Diagram 1:**





16. As to claim 11, Takagi discloses that the optical system forms a pupil image in an optical path of the displaying luminous flux in the first optical element (see figure 17, the top of element 31 and Diagram 1 provided by the examiner above).

17. As to claim 12, Takagi discloses that the optical system forms a pupil image in an optical path of the displaying luminous flux in the second optical element (see figure 17, element 21 and Diagram 1 provided by the examiner above).

18. As to claim 13, Takagi discloses that at least one of the first and second optical elements includes a reflective surface decentered with respect to an optical path of the displaying luminous flux (see figure 17, elements S2-S9).

19. As to claim 14, Takagi discloses a display device (see figure 17, element SI) which forms an original image (see figure 17, element SI); and the optical system according to claim 9 (see section 14 of this office action).

***Claim Rejections - 35 USC § 103***

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeyama, U.S. Patent Publication 2002/0039232, of record (hereafter Takeyama) in view of Imamura et al., U.S. Publication No. 2002/0180907, of record (hereafter Imamura).

22. As to claim 2, Takeyama discloses the combination of claim 1, having a display device (see figure 14, element 36 of Takeyama).

Takeyama does not teach that the display device is a reflective display device or that the optical system further comprises a third optical element between the reflective display device and the second optical element.

However, Imamura discloses a reflective display device (see figure 1 of Imamura) that further comprises a polarizing plate on the reflective display device (see figure 1, element 19 of Imamura).

Therefore, it would have been obvious to someone of ordinary skill in the art at the time the invention was made to replace the display device of Takeyama with a reflective display device of Imamura and to put a polarizing plate in front of the reflective display device, as taught by Imamura, and therefore between the reflective display device and the second optical element of Takeyama for the purpose of only allowing desirable polarizations of light to reflect off the LCD and for glare reduction and brightness enhancement.

23. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi et al, U.S. Patent Number 7,012,756 B2, of record (hereafter Takagi) in view of Imamura et al., U.S. Publication No. 2002/0180907, of record (hereafter Imamura).

24. As to claim 10, Takagi discloses the combination of claim 9, having a display device (see figure 24, element SI of Takagi).

Takagi does not teach that the display device is a reflective display device or that the optical system further comprises a third optical element between the reflective display device and the second optical element.

However, Imamura discloses a reflective display device (see figure 1 of Imamura) that further comprises a polarizing plate on the reflective display device (see figure 1, element 19 of Imamura).

Therefore, it would have been obvious to someone of ordinary skill in the art at the time the invention was made to replace the display device of Takagi with a reflective display device of Imamura and to put a polarizing plate in front of the reflective display

device, as taught by Imamura, and therefore between the reflective display device and the second optical element of Takagi for the purpose of only allowing desirable polarizations of light to reflect off the LCD and for glare reduction and brightness enhancement.

***Response to Arguments***

25. Applicant's arguments, see pages 8-10, filed 4/5/2007, with respect to the rejections of claims 7, 9, 11 and 13-14 in view of Takeyama in that Takeyama does not have an inner product which is formed between outer products, have been fully considered and are persuasive. The rejections of claims 7, 9, 11 and 13-14 in view of Takeyama have been withdrawn.

26. Applicant's arguments, see pages 6-8, filed 4/5/2007, with respect to the rejections of claims 1, 3, 5 and 8 in view of Takeyama and the rejections of claims 9 and 11-14 in view of Takagi, have been fully considered but they are not persuasive.

As to the rejections in view of Takeyama, the last paragraph of claim 1 reads on applicant's figure 1 and not applicant's figures 2 and 3. Therefore, the structure of figure 14 of Takeyama appears to be very similar to figure 1 of the instant application and therefore reads on claim 1 (see section 8 of this office action above).

As to the rejections in view of Takagi, the examiner agrees that a standard equation for power for spherical lenses does not accurately describe the relationship between surfaces 'S7' and 'S8' of Takagi since surfaces 'S7' and 'S8' are aspheric surfaces. Therefore, ray tracing figure 17 is interpreted to be more accurate in

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describing the relationship between surfaces 'S7' and 'S8'. The arguments on page 7 do not accurately interpret the rays of figure 17 of Takagi in that only the light rays from the center of the display were traced and not rays from all three bundles of light being admitted by the display. When tracing rays from all three bundles of light being admitted by the display, the rays guided to surface 'S8' are diverging and the light passed through the surface 'S7' are further diverging, indicating that the air lens formed by surfaces 'S7' and 'S8' has a negative power. Further the inner product which is formed between outer products is negative for figure 17 of Takagi.

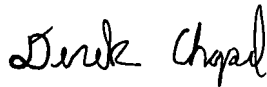
### ***Conclusion***

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek S. Chapel whose telephone number is 571-272-8042. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
DSC  
4/25/2007

  
Stephone B. Allen  
Supervisory Patent Examiner